CLAIM AMENDMENTS

1 - 52.   (canceled)

53.   (new)   A device comprising:

a plurality of electrodes each capable of stimulating a neuron population having a pathologically synchronous neuronal activity; and

means for generating and feeding stimulation signals to the electrodes for stimulation by each of the electrodes a respective neuron subpopulation of the neuron population and resetting or reversing with the stimulation signals phases of the stimulated neuron subpopulation at different points in time.

54.   (new)   The device of claim 53 wherein a stimulation signal is an individual pulse or a pulse train.

55.   (new)   The device of claim 53 wherein the number of the plurality of electrodes is N,

the neuron population has a pathologically oscillatory neuronal activity with a mean period duration T, and

the stimulation signals are fed by the means to the electrodes such that a phase offset between two neuron subpopulations substantially amounts to T/N.

1   56.   (new)   The device of claim 55 wherein the

2   stimulation signals are repeatedly fed to the electrodes by the

3   means such that time intervals between successive stimulation

4   signals are substantially whole number multiples of the mean period

5   duration T.

1   57.   (new)   The device of claim 53 wherein

2   at least one electrode of the plurality of the

3   electrodes stimulates the respective neuron subpopulation directly,

4   or

5   at least one electrode of the plurality of the electrodes

6   stimulates a further neuron population that is connected to the

7   respective neuron population having the pathologically synchronous

8   neuronal activity by a nerve fiber bundle, or

9   at least one electrode of the plurality of the electrodes

10   stimulates a nerve fiber bundle that is connected to the neuron

11   population having the pathologically synchronous neuronal activity.

1   58.   (new)   A device comprising:

2   a plurality of electrodes each capable of stimulating a

3   neuron population having a pathologically synchronous neuronal

4   activity; and

5   means for generating and feeding phase-resetting or

6   phase-reversing stimulation signals to the electrodes such that two

7   successive phase-resetting or phase-reversing stimulation signals

8   are fed into different electrodes at respective offset times.

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1   59.   (new)   The device of claim 58 wherein the phases of
2   the two successive phase-resetting or phase-reversing stimulation
3   signals are temporally offset relative to one other.

1   60.   (new)   The device of claim 58 wherein a
2   phase-resetting or phase-reversing stimulation signal is an
3   individual pulse or a pulse train.

1   61.   (new)   The device of claim 58 wherein the time
2   offset between successive phase-resetting or phase-reversing
3   stimulation signals is substantially constant.

1   62.   (new)   The device of claim 58 wherein
2   the number of the plurality of electrodes is N,
3   the neuron population has a pathologically oscillatory
4   neuronal activity with a mean period duration T, and
5   a time offset between two successive phase- resetting or
6   phase-reversing stimulation signals substantially amounts to T/N.

1   63.   (new)   The device of claim 62 wherein
2   phase-resetting or phase-reversing stimulation signals are
3   repeatedly fed into an individual electrode such that time
4   intervals between successive phase-resetting or phase-reversing
5   stimulation signals are substantially whole number multiples of the
6   mean period duration T.

1   64.   (new)   A device comprising:

2   a plural number N of electrodes each capable of

3   stimulating a neuron population having a pathologically oscillatory

4   neuronal activity with a mean period duration T; and

5   means for generating and feeding stimulation signals to

6   the electrodes such that a time offset between two successive

7   stimulation signals that are fed into different electrodes

8   substantially amounts to T/N.

1   65.   (new)   The device of claim 64 wherein the time

2   offset between the phases of the two successive stimulation signals

3   substantially amounts to T/N.

1   66.   (new)   The device of claim 64 wherein

2   each of the electrodes stimulates a respective neuron

3   subpopulation of the neuron population, and

4   a stimulation signal resets or reverses a phase of the

5   respective stimulated neuron subpopulation.

1   67.   (new)   The device of claim 64 wherein stimulation

2   signals are repeatedly fed into an individual electrode such that

3   time intervals between successive stimulation signals are

4   substantially whole number multiples of the mean period duration T.

1   68. (new) A method comprising the steps of:

2   applying stimulation signals to a plural number N of

3   stimulation sites of a neuron population having a pathologically

4   synchronous neuronal activity such that

5   the stimulation signals reset or reverse a phase of

6   neuron subpopulations situated at the respective stimulation sites,

7   and

8   two successive stimulation signals applied to different

9   stimulation sites are temporally offset relative to one other.

1   69. (new) The method of claim 68 wherein the phases of

2   the two successive stimulation signals are temporally offset

3   relative to one other.

1   70. (new) The method of claim 68 wherein the time

2   offset between successive stimulation signals is substantially

3   constant.

1   71. (new) The method of claim 68 wherein the neuron

2   population has a pathologically oscillatory neuronal activity with

3   a mean period duration T, and the time offset between the two

4   successive stimulation signals substantially amounts to T/N.

1   72.   (new)   The method of claim 71 wherein stimulation
2   signals are repeatedly applied to an individual stimulation site
3   such that time intervals between successive stimulation signals are
4   substantially whole number multiples of the mean period duration T.

1   73.   (new)   The method of claim 68 wherein the method is
2   used to treat pathologies, in particular parkinsonism, essential
3   tremor, dystonia, obsessive disorders or epilepsy.

1   74.   (new)   A method comprising the step of
2   applying stimulation signals to a number N of stimulation
3   sites of a neuron population having a pathologically oscillatory
4   neuronal activity with a mean period duration T and with a time
5   offset between two successive stimulation signals applied to
6   different stimulation sites substantially equal to T/N.

1   75.   (new)   The method of claim 74 wherein the time
2   offset between the phases of the two successive stimulation signals
3   is substantially equal to T/N.

1   76.   (new)   The method of claim 74 wherein a stimulation
2   signal applied to the respective stimulation site resets or
3   reverses a phase of a neuron subpopulation situated at the
4   respective stimulation site.

1   77.   (new)   The method of claim 74 wherein stimulation
2   signals are repeatedly applied to an individual stimulation site
3   such that time intervals between successive stimulation signals are
4   substantially whole number multiples of the mean period duration T.